

IMPROVEMENT OF FERTILITY USING BUSERELIN ACETATE IN REPEAT BREEDING CATTLE

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Received : 12.02.15

ABSTRACT

Accepted : 21.07.15

Repeat breeding (RB) syndrome is a frustrating infertility problem in the dairy cow. The present study was planned to observe the efficacy of GnRH analoge on conception rate (CR) in RB cows at the time of insemination. Insemination data were retrieved from breeding records over a period of 44 months. RB cow was selected based on failure to conceive upon 3-5 inseminations and without any palpable abnormality of the reproductive tract and categorized into two groups: Group I cows (n=50) were treated with GnRH analoge (Buserelin acetate, Receptal[®], 2.5 mL, i/m) at the time of AI and Group II untreated control (n=50) RB cows. Pregnancy diagnosis was done by rectal palpation at 60 days post breeding. The association between GnRH administration and CR in RB cow was analyzed by using Chi-Square test at 5% level of significance. In treatment group CR was recorded as 32% (16/50) whereas in control group the corresponding figure was 20% (10/50). No significant difference was found between GnRH treated and untreated RB cows with respect to CR ($P > 0.05$); however, CR was 12% higher in GnRH treated cows. In conclusion, an apparent increase in the CR in GnRH treated RB cows is socially important in India where cow slaughter is banned in many states, besides rescuing the elite high yielding animals from involuntary culling.

Key word: Buserelin acetate, Fertility, Repeat breeding cattle

Repeat breeding (RB) syndrome is a frustrating infertility problem in the dairy cow that decreases the lifetime productivity by widening the calving interval leading to economic loss in dairy industry. Among the various reproductive disorders, incidence of RB is 10-25% (Bartlett *et al.*, 1986). Prolonged estrus in RB crossbred cattle has been recorded up to the tune of 30-40% (Dadarwalet *et al.*, 2005). Suprabasal progesterone (P_4) is imputed as a cause of delayed ovulation due to improper LH surge (Bage *et al.*, 2002).

The occurrence of prolonged estrus and presence of suprabasal P_4 at estrus is a phenomenon that occurs repeatedly in consecutive cycles, and

leads to repeated conception failure in dairy cattle (Singh *et al.*, 2008). Different hormonal and non-hormonal drugs are used in therapeutics of RB. Gonadotrophin releasing hormone (GnRH), P_4 and antimicrobials have been used successfully in order to enhance reproductive efficiency in infertile dairy animals with good nutritional status (Thatcher *et al.*, 2006). Administration of GnRH analogs at the time of insemination has shown to improve the conception rate (CR) in RB cows in large scale trials (Peters, 2005). The present report documents the efficacy of GnRH analog on CR in RB cows on organized farm.

Insemination data were retrieved from the Artificial Insemination (AI) Unit, Livestock Production and Management Section, IVRI, Izatnagar for a period of 44 months (January 2010 to August 2013) and categorized into group I and group II. Group I cows (n=50) were treated with GnRH analoge (Buserelin acetate, Receptal[®], 2.5 mL, i/m) treated

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at the time of AI and group II was untreated control (n=50) RB cows. RB cow was defined as failure to conceive upon three to five inseminations and without any palpable abnormality of the reproductive tract. Estrus detection was done twice daily through bull parading by experienced herdsman. At estrus, insemination was done with frozen semen adopting standard practices. Pregnancy diagnosis was done by rectal palpation at 60 days post breeding. The association between GnRH administration and CR in RB cow was analyzed by using Chi-Square test at 5% significance (Agresti, 1996). Relative risk was also calculated. The farm practices were uniform during the study period.

In treatment group CR was recorded as 32% (16/50) whereas in control group the corresponding figure was 20% (10/50). No significant difference was found between GnRH treated and untreated RB cows with respect to CR ($P > 0.05$); however, CR was 12% higher in GnRH treated cows. The relative risk of a RB cow to become pregnant following GnRH administration at AI was 1.6 times more than an untreated cow. The results concur with the previous studies (Phatak *et al.*, 1986; Gumen *et al.*, 2011).

However, many studies have found a positive effect of GnRH administration at AI on CR in RB cows (Shephard *et al.*, 2014). It is reported that GnRH therapy at AI was not effective in herds with good fertility background (Peters, 2005). Treatment with GnRH as Δ holding injection at the time of AI is aimed to ensure timely ovulation and luteinization that would favour embryonic survival in RB cows. Delayed ovulating RB cows are benefited from GnRH treatment by hastening ovulation and improved fertilization rates (Lucy and Stevenson, 1986). Maurer and Echternkamp (1982) reported that higher embryo survival in cows is accompanied with higher preovulatory LH surge and earlier post ovulatory rise of luteal P_4 . Though the result was statistically non-significant but chances to become pregnant following GnRH analog administration at AI was 1.6 times more than untreated cows. An apparent increase in the CR in GnRH treated RB cows is socially important in

India where cow slaughter is banned in many states, besides rescuing the elite high yielding animals from involuntary

REFERENCES

- Bage R. (2002). Δ On repeat breeding in dairy heifers. With special focus on follicular dynamics, ovulation and oocyte quality. Ph. D Thesis, Swedish University of Agricultural Sciences, Uppsala, Sweden.
- Bartlett P.C., Kirk J.H. and Mather E.C. (1986). Repeated insemination in Michigan Holstein Friesian cattle: incidence, descriptive epidemiology and estimated economic impact. *Theriogenology*, **26**: 309-22.
- Dadarwal D., Singh Jagir., Honparkhe M., Cheede G. S. and Kang R. S., (2005). Investigations on repeat breeding crossbred cattle with history of prolonged oestrus. *Indian J. Anim. Sci.*, **75**: 922-24.
- Gumen A., A. Keskin A., Yilmazbas-Mecitoglu G., Karakaya G. E., Cevik S. and Balci F. (2011). Effects of GnRH, PGF $_{2\alpha}$ and oxytocin treatments on conception rate at the time of artificial insemination in lactating dairy cows. *Czech. J. Anim. Sci.*, **56**(6): 279-283
- Lucy M.C. and Stevenson J.S. (1986). Gonadotropin Releasing Hormone at estrus: luteinizing hormone, oestradiol and progesterone during the peri-estrus and postinsemination period in dairy cattle. *Biol. Reprod.*, **35**: 300-311.
- Maurer R. R. and Echternkamp S. E. (1982). Hormonal asynchrony and embryonic development. *Theriogenology*, **17**:11.
- Peter A. R. (2005). Veterinary clinical application of GnRH questions of efficacy. *Anim. Reprod. Sci.*, **88**:155-167
- Phatak A. P., Whitmore H. L. and Brown M. D. (1986). Effect of gonadotrophin releasing hormone on

- conception rate in repeat breeding dairy cows. *Theriogenology*, **26**:605.
- Shephard R.W., Morton J. M. and Norman S.T. (2014). Effects of administration of gonadotropin-releasing hormone at artificial insemination on conception rates in dairy cows. *Anim. Reprod. Sci.*, **144**:14-21
- Singh N., Nanda A.S. and Singh J. (2008). Assessment of factors affecting conception rate in cross-bred cows following AI under field conditions. *Indian J. Anim. Reprod.*, **29**: 211-215.
- Thatcher W. W., Bilby T. R., Bartolome J. A., Silvestre F., Staples C. R. and Santos J. E. P. (2006). Strategies for improving fertility in the modern dairy cow. *Theriogenology*, **65**:30-44.